As recited in claim 35 (see also claims 1, 14, 22, 31, 33 and 34), Applicants' image compression scheme can work by defining a texture palette, drawing an image and filling parts of the image with textures from the texture palette, and then decolorizing the image for compression. In one embodiment, the texture palette assigns a one-byte code for each of 253 possible textures (see new claim 43). During the decolorization phase, a representative pixel from each region is put into a list, along with the texture that corresponds to that region. This corresponds to the "generating a pointer for each of said regions, each of said pointers associating its respected regions with one of said textures for the image in such region" recitation of claims 1, 14, and 33 (see also claims 15, 22, 31 and 34). The list contains the location of the representative pixel, along with the texture value of the pixel. Figure 7 illustrates the decolorization where the list 80 is generated. The list 80, for example is where the recited "pointer" can be created.

Arguments

At the outset, Applicants note that the overall view of the Advisory Action of April 6, 1999 and prior Office Action appears to be that mere discussion of regions, textures, boundaries, images, and pointers in the cited art renders Applicants' claimed subject matter (many of which are method claims) obvious. There appears to be no consideration by the Patent Office of the claimed functional or structural relationship between these boundaries, regions, textures, images, and pointers. The cited art fails to teach or suggest at least the following claimed subject matter:

- Generation of a bitmap having regions corresponding to different textures
- Pointers associating a region with a texture, and
- Boundaries separating regions of different textures

It should be understood that an invention can be claimed in terms of structure and/or function.

The cited art fails to teach or suggest "generating a bitmap representing boundary pixels ... separating regions ... composed of ... textures" (claims 1, 14, 15, 22, 31, 33, and 34).

Gentile fails to teach or suggest generating the claimed bitmap. Gentile is instead directed to image decomposition, not generation of an image. Further, Gentile does not disclose textures, as the Advisory Action asserts.

Besides, the use of *textures* recited in several of Applicants' claims is not the only subject matter recited therein. The "generating a bitmap" step of method claims 1, 14, and 33 and apparatus claim 34 and the "providing a bitmap" step of method claims 22 and 31 are

directed to the initial creation of an image which may include different textures. Also, a *particular* bitmap is generated: one composed of boundary pixels and regions, these regions being made up of the textures.

Gentile proposes taking an image and separating the image into R different data regions. The data regions can be determined in advance (e.g., text regions, graphic regions, and image regions). Alternatively, the page can arbitrarily be separated into a grid of smaller regions (col. 5, line 64 - col. 6, line 2). Gentile proposes this separation of the image into regions because different compression schemes work better with different image types. An image is thus separated into these different regions so that different compression schemes can be applied to the different region types. One skilled in the art, based upon the discussion in Gentile, would not be motivated to generate the bitmap recited in the above-referenced claims.

The cited art fails to teach or suggest "pointers associating ... regions with ... textures" (claims 1, 14, 15, 22, 31, 33, and 34).

In Gentile, each region is made up of one or more objects and the objects are made up of primitive elements. For text, a primitive element may be a character. For graphics, a primitive element may be a geometric shape, such as a circle or a triangle (col. 7, lines 9-16). For each region, a display list of primitive elements is created. Gentile states: "[i]n some instances, these primitive elements are stored in the display list indirectly via pointers." This use of pointers may apply where a primitive element is seen repeatedly in the image, for example. That image may be stored as a bitmap, and a pointer to that bitmap is represented in the image.

Gentile's use of pointers is different from that of Applicants because, for one thing, Gentile's pointers do not associate a region with a texture. Gentile's pointers may associate a primitive element with a region, but primitive elements are not textures. Applicant's claim 1 recites the following: "generating a pointer for each of said region, each of said pointers associating its respective region with the one of said textures for the image in such region" (see also claims 14, 15, 22, 31, 33, and 34). This is, for example, where the list 80 can be created (see Figure 7). The list contains a representative pixel (the top, left-most pixel of a region in one embodiment) and associates the pixel with a code representing a texture. (Recall that, initially, all the possible textures of the image are assigned a unique code.) This pointer generation step "prepares" the image for conversion to a monochrome bitmap.

The cited art fails to teach or suggest "boundaries ... separating regions of [different] ...textures" (claims 1, 14, 15, 22, 31, 33, and 34).

Applicants' claimed "regions of different textures" are not artificially separated divisions of an image, as in Gentile, but are the natural boundaries of the digital image itself, just as any drawing of an image has regions (and therefore boundaries). These regions may include any one of the textures that make up the texture map (see first step of claim 35). The boundaries in Gentile separate regions of predetermined objects, such as text, title heading, text section, graphics subheading, etc. (col. 5, lines 66-67). These different objects do not represent different "textures," as should be understood from Applicants' specification. In one embodiment, where the image is an alien represented in Applicants' Figure 2, one texture may correspond to green and yellow stripes, for example, another to "transparent" texture, a third to a solid color such as red, a fourth to speckled blue, and so on. Applicants' claimed regions of textures thus *are part of the image* and are not artificially generated, based upon some arbitrary or formulaic assignment, as in Gentile. Instead, the regions make up the intended digital image itself.

Further, the "primitive elements" in Gentile are not analogous to Applicants' claimed "textures." Gentile uses primitive elements to breakdown the image into further regions. Even when the regions of an image are arbitrarily chosen, such as indicated by the horizontal lines explicitly shown in Figure 2 of Gentile, the reference apparently seeks to define the portions of each region into a more or less closed group of elements. Particularly for graphics regions, primitive elements may have shape, color, and other features.

Applicants' textures, in contrast, are essentially "wallpaper" to be applied to an image. Where primitive elements can have shape, textures lack shape. In Applicants' disclosure each pixel in a region has a texture, and pixels have the same shape. It is a region, which is filled by a texture, that may have shape. This shows that primitive elements and textures are different from one another. Thus, where Gentile states that "those primitive elements are stored in the display list indirectly via pointers" (col. 7, lines 18-19), the suggestion that is made is to break down an image into its primitive elements and store the primitive elements in a list. According to Gentile's teaching, Applicants' list 80 might have included a code for the alien's arm, a second code for the alien's hand, a third code for his belt, and so on, rather than the type of list 80 actually shown in Figure 7. Clearly, this is not suggestive of Applicants' claimed subject matter.

Robinson

Although the Advisory Action did not discuss Robinson, the reference was relied up in the final Office Action of the parent case as allegedly teaching Applicants' use of textures and bitmaps representing boundaries. Accordingly, some discussion of Robinson may be helpful.

In Robinson, texture maps are maps which store a predefined irregular coloring, pattern, or other predefined feature which is overlaid on a predefined polygon (col. 1, lines 30-33). Traditionally, usage of texture maps required that the transparency, color, or intensity value be stored for each texel. Robinson proposes a new kind of spatial contour texture map where, instead of storing transparency, color, or intensity for each texel, the *distance* between each texel and a boundary between regions of different intensity, for example, is stored. By storing the distance, less storage space is needed. According to Robinson, this spatial contour texture map is then used to render an image such as a polygon with the desired textures.

So, Robinson proposes to generate the spatial contour texture map as follows:

> The spatial contour texture map is generated by defining first and second areas characterized respectively by a first texture value V1 and a second texture value V2. The texture values may be color, transparency, intensity or any other texture characteristic. The first area and the second area are divided by a boundary. For each texel of the contour texture map, the shortest spatial distance between the texel and the boundary is next determined (col. 2, lines 44 - 52).

The distance is what ends up being stored in lieu of intensity, color, etc. Thus, Robinson teaches "boundaries in a texture map." In contrast, Applicants' claimed subject matter recites "boundary pixels." Boundary pixels are boundaries between regions in a bitmap, as defined by Applicants' claimed subject matter. A boundary also "delineates" the image to be displayed. Thus, the boundaries constitute the outline of the image itself. These boundaries typically are black pixels, according to one embodiment.

The reason for the creation of a boundary in Robinson between color, transparency, or intensity of one value and that of another is so that, in lieu of storing these values, the distance from one to another value may be stored. Using the distance, a more accurate mapping of the texture onto the planar polygon can be calculated (Figure 4 and col. 7, lines 40-74).

Applicants' claimed subject matter is storing the color (actually, *texture*) value for a representative pixel of each region. The claimed subject matter thus recites boundary pixels

that basically delineate between pixels of different textures/colors. So, the boundary pixels are used for an entirely different purpose than the boundaries of a texture map in Robinson. Applicants' claimed subject matter is not concerned with the distance of any one pixel from the boundary pixel, only that one pixel is adjacent to another pixel of the same texture. If one pixel is adjacent to another pixel in the same region, these pixels will be "filled" together when the monochrome bitmap is generated. Robinson thus does not disclose, teach or suggest boundaries separating regions of different textures.

Conclusion

For the foregoing reasons, Applicants submit that claims 1-43 are allowable as written. If there are any questions or comments, please contact George W. Jordan III or David R. Clonts at (713) 220-5800.

Respectfully submitted,

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I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231, on 5/21, 1999.

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